User's Guide to MOBILE6 Errata
(Last Updated, March 8, 2002)

Section: 2.8.8.2.d
Subject: AVERAGE SPEED command limits
Level: Serious
Date: March 8, 2002

The January 2002 MOBILE6 User Guide text (incorrect):

Freeway

> The "Freeway" roadway scenario assigns all VMT to either the freeway or
> the freeway ramp roadway types. Freeway ramps have a constant speed of
> 34.6 mph, which cannot be changed by the user. A single average speed
> for the non-ramp freeway VMT is calculated using the fixed freeway ramp
> average speed and the freeway ramp VMT fraction such that the combined
> average speed matches the average speed value entered by the user. All of
> the non-ramp freeway VMT is then automatically distributed among two
> average speed bins which average to the calculated average non-ramp
> freeway speed. If the user does not specify the distribution of VMT by
> facility, the national average fraction of freeway ramp activity (8%
> freeway ramp and 92% non-ramp freeway) is used.

> Since the freeway ramp speed is fixed, depending on the fraction of VMT
> for freeway ramps, MOBILE6 may not be able to model the average speed
> indicated by the user. In these cases a calculated maximum speed or a
> calculated minimum speed is substituted for the user supplied average
> speed and a warning, indicating the actual average speed used, is written to
> the descriptive output.

The corrected MOBILE6 User Guide text:

Freeway

> The "Freeway" roadway scenario assigns all VMT to either the freeway or
> the freeway ramp roadway types. If the user does not specify the
> distribution of VMT by facility, the national average fraction of freeway

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ramp activity (8% freeway ramp and 92% non-ramp freeway) is used. Freeway ramps have a constant speed of 34.6 mph, which cannot be changed by the user. A single average speed for the non-ramp freeway VMT is calculated using the fixed freeway ramp average speed and the freeway ramp VMT fraction such that the combined ramp and non-ramp average speed matches the average speed value entered by the user. All of the non-ramp freeway VMT is then automatically distributed among two average speed bins which average to the calculated average non-ramp freeway speed.

While the MOBILE6 model checks that the AVERAGE SPEED input is between 2.5 and 65 mph, the FREEWAY option does not issue a warning if the calculated non-ramp freeway speed falls outside these limits. The user must take care that the model not calculate emissions for freeway speeds outside this range.

For the default freeway ramp fraction (8%), the maximum combined non-ramp freeway and ramp average speed in MOBILE6 is 60.73 mph. For speeds above 60.73, the MOBILE6 emission values will be incorrect. Similarly, with 8% freeway ramps, the minimum combined non-ramp freeway and ramp average speed is 2.71 mph. For speeds below 2.71 mph, the MOBILE6 emission values will be incorrect.

For other fractions of freeway ramp VMT, the minimum and maximum combined non-ramp and ramp average speed for the AVERAGE SPEED FREEWAY option can be calculated using the following equations:

Max Freeway Average Speed = 1/((1/65)*(1-RampVMT)+(1/34.6)*RampVMT)
Min Freeway Average Speed = 1/((1/2.5)*(1-RampVMT)+(1/34.6)*RampVMT)

If it is necessary to estimate emissions outside the allowed range for Freeway Average speed, the emissions should be estimated as equal to the emissions at the minimum or maximum described above.